

## Indiana University – Purdue University Fort Wayne Opus: Research & Creativity at IPFW

---

Computer and Electrical Engineering Technology &  
Information Systems and Technology Senior Design  
Projects

School of Engineering, Technology and Computer  
Science Design Projects

---

Spring 4-2011

# Indiana Air National Guard Wireless LAN Phase II Install

Joseph Till

*Indiana University - Purdue University Fort Wayne*

Follow this and additional works at: [http://opus.ipfw.edu/etcs\\_seniorproj](http://opus.ipfw.edu/etcs_seniorproj)



Part of the [Computer Sciences Commons](#), and the [Engineering Commons](#)

---

### Opus Citation

Joseph Till (2011). Indiana Air National Guard Wireless LAN Phase II Install.  
[http://opus.ipfw.edu/etcs\\_seniorproj/910](http://opus.ipfw.edu/etcs_seniorproj/910)

This Senior Design Project is brought to you for free and open access by the School of Engineering, Technology and Computer Science Design Projects at Opus: Research & Creativity at IPFW. It has been accepted for inclusion in Computer and Electrical Engineering Technology & Information Systems and Technology Senior Design Projects by an authorized administrator of Opus: Research & Creativity at IPFW. For more information, please contact [admin@lib.ipfw.edu](mailto:admin@lib.ipfw.edu).

# Indiana Air National Guard Wireless LAN Phase II Install

Final Project Report

29 APR 2011

By: Joseph Till

Advisor: Naro Hewitt, Telos Installation Engineer

Submitted to:

Iskandar Hack, Professor of CPET 491 Senior Design II

Department of Electrical and Computer Engineering Technology

College of Engineering, Technology, and Computer Science

Indiana University-Purdue University Fort Wayne, Indiana

## **Abstract**

Wireless IEEE 802.11 technology is not a new standard by today's measurements. It's origin goes back to mid-1997, providing small bandwidth and limited range. However, that technology was not very practical for use in a business aspect. With advancement in technology and modern implementation, it has shown to be a viable asset to provide connectivity to multiple users in a usable and secure way.

With bandwidth as high as, or higher in some cases, than most person's at home internet speeds, Wireless LAN technology is proving to be cheaper and just as reliable as wired connections in an office and even educational settings. This project report is based on an Air National Guard wide project that is the second phase of an Air Guard wide installation and implementation of Wireless LAN.

With this project, focused at the 122d Fighter Wing in Fort Wayne, IN, they will be almost doubling their wireless access point count, tripling the amount of users that can access the wireless LAN, and installing and configuring a redundant system in case of equipment failure or so technicians can perform upgrades and maintenance while minimizing downtime.

**Disclaimer: As some of the information contained below is sensitive information, for security reasons, some information has been omitted, cannot be fully described or has been changed.**

## **Table of Contents**

Chapter 1 Introduction.....	1
1.1 Overview.....	1
1.2 Problem Statement.....	1
1.3 Background.....	2
1.4 Regulatory, Standards, Safety, and Quality Issues.....	3
1.5 Roles of Personnel.....	3
Chapter 2 System Design Overview.....	5
2.1 System Overview.....	5
2.2 Network Configuration.....	6
2.3 Legal Aspects.....	6
Chapter 3 Hardware Design.....	8
3.1 AP-60 Configuration.....	8
3.2 Antenna Configuration.....	8
3.3 AP-60 Installation.....	9
Chapter 4 Software Design.....	13
4.1 Aruba Controller Configurations.....	13
4.1 Laptop Configurations.....	13
Chapter 5 Unit Testing.....	15
5.1 Software Testing.....	15
5.2 Hardware Testing.....	15
Chapter 6 Project Management.....	16
6.1 Project Schedule.....	16
6.2 Resources and Cost.....	16
6.3 Risk Management.....	16
6.4 Lessons Learned.....	17
Chapter 7 Conclusion.....	18
7.1 Project Summary.....	18
7.2 Expansion.....	18